

Roll No. 

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Total No. of Pages : 02

Total No. of Questions : 18

**MCA (Sem.-1)**  
**DISCRETE STRUCTURES & OPTIMIZATION**  
Subject Code : PGCA-1917  
Paper ID : 79035

Time : 3 Hrs.

Max. Marks : 70

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

**SECTION-A**

**Write short notes on :**

- 1) What are ordered pairs?
- 2) Write the concept of Hashing Function.
- 3) Discuss rings in discrete structure.
- 4) What is meant by isomorphic in graph theory?
- 5) Give an example of a finite group.
- 6) Write about principle of Inclusion.
- 7) Define undirected graph.
- 8) What is Indegree of Graph?
- 9) What is use of Karnaugh Map?
- 10) What do you mean by chromatic number?

### SECTION-B

- 11) Give the properties of relations and functions.
- 12) Prove that a graph  $G$  with  $e = v - 1$  that has no circuit is a tree.
- 13) How eulerian chains and cycles are related to connected graph?
- 14) Let  $a, b$  be elements of a Boolean algebra then show that  $a'b' + ab + a'b = a' + b$ .

### SECTION-C

- 15) Discuss pigeon hole principle in combinatorial mathematics.
- 16) What is semigroup show with example?
- 17) How do you use a graph to solve a coloring problem?
- 18) What is the difference between a permutation and a combination? Show with example.

**NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.**